Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Title V Draft Permit V-06-020
CALGON CARBON CORPORATION
CATLETTSBURG, KENTUCKY 41129
February 28, 2006
REVIEWER: JOSHUA J. HIGGINS

Source I.D. #: 21-019-00014
Source A.I.#: 315
Activity #: APE20050001

SOURCE DESCRIPTION:
Calgon Carbon Corporation operates a primary activated carbon and recycle carbon regeneration plant in Catlettsburg, Kentucky. Activated carbon is produced from high-grade bituminous coal. Coal is received and stored in silos, ground to fine powder, mixed with pitch, and pelletized to form a briquette. This briquette is crushed and screened and the carbon is baked to remove volatiles in kilns. After baking the carbon is 'activated' in furnaces. The activated carbon is then cooled and transferred to screening and packaging operations. The plant also produces several specialty products including acid washed carbon, fine carbon, and impregnated carbon products.

Fine carbon is produced using a roll mill and screens while the acid-washed carbon is produced by washing sized carbon with a hydrogen chloride solution. This process removes ash and iron making the carbon suitable for food-grade applications. Residual acid from the process is neutralized with soda ash and the carbon is dried in a direct-fired kiln.

The carbon regeneration plant receives spent carbon from end-users of activated carbon and desorbs the adsorbed materials, thereby regenerating the carbon for reuse. This plant consists of spent carbon storage vessels, washers to remove sand, dewatering steps, and a nine-hearth reactivation furnace. The top two hearths of the furnace serve as an afterburner that discharges into a spray dryer scrubber. Sodium carbonate is used in the spray dryer to remove acidic gases, primarily hydrogen chloride and sulfur dioxide. Final particle collection is performed by a fabric filter.

Calgon operated previously under the following Title V permits: V-00-015 issued August 21, 2000; V-00-015, Revision 1 issued July 10, 2003; and V-00-015, Revision 2 issued March 1, 2004.

COMMENTS:

Types of control and efficiency:

There are numerous control devices at the Calgon facility. These can be broadly classified into the following categories:

1. Cold sources - these are mainly material handling sources and are typically controlled by a baghouse with an assumed efficiency of 99% based on vendor's guarantee.
2. Hot sources - this category includes the bakers and activators that are equipped with wet scrubbers for the control of particulate matter (85%) and sulfur dioxide (75%). Based on permit V-00-015, Revision 2, the wet scrubbers associated with the B and C-Line Activators must have a particulate matter and sulfur dioxide removal efficiency of at least 90%. Afterburners on each of the bakers, and afterburners integrated into the Activators reduce VOC emissions by 98% prior to discharge to the atmosphere.
3. Reactivation Furnace - the reactivation furnace is equipped with a dry scrubber for sulfur dioxide emissions (85%), a baghouse for particulate emissions (99%), an afterburner and carbon adsorber for VOC emissions (98%).

Emission factors and their source:

AP-42 emission factors were used for the combustion sources. Most of the remaining emission factors were back-calculated from permit limits since little evidence could be found to support the existing EIS factors, and because most emission calculations and control equipment design specifications from the original Title V application received 11/24/1998 did not produce similar results. The POC table and/or the comments section of each Subject Item in TEMPO contains a more detailed point-by-point explanation. This permit requires testing at several emission units to determine compliance with applicable regulations and to determine more representative emission factors.

Applicable regulations:

The following regulations apply to this facility:

1. 401 KAR 50:012, General Application, applies to each affected facility that emits volatile organic compounds (VOC). The Reasonable Available Control Technology (RACT) requirements are carried over from previous permits.
2. 401 KAR 53:005, *General provisions*, was applied to emission points 14, 21, 26, 32, 39, 40, and 42 during issuance of V-00-015, Revision 2 in order to enforce the modeled SO_2 reductions and enforce NAAQS. The emission limitations established with issuance of that permit are carried over into the renewal permit.
3. 401 KAR 59:010, *New Process Operations*, applies to each affected facility that emits particulate matter and was constructed after July 2, 1975.
4. 401 KAR 57:002, which incorporates by reference federal regulation 40 CFR 61 Subpart FF, *National emission standard for benzene waste operations*, applies to the Spent Carbon Storage Tanks at the Reactivation Furnace.
5. 401 KAR 61:020, *Existing Process Operations*, applies to each affected facility that emits particulate matter and was constructed prior to July 2, 1975.
6. 40 CFR 64, *Compliance Assurance Monitoring*, applies to numerous emission points and pollutants. See the following table.

Emission Point	Description	Pollutant(s)
08	A-Line Packaging Operations	PM/PM_{10}
Emission Point	Description	Pollutant(s)
09	B-Line Coal and Pitch Preparation Area	PM/PM_{10}
11	B-Line Bakers	PM/PM_{10}, & SO2
14	B-Line Activator Furnace	PM/PM_{10}, & SO2
15	B-Line Packaging operations	PM/PM_{10}
21	C-Line Activator Furnaces	PM/PM_{10}, & SO2
22	C-Line Packaging operations	PM/PM_{10}
25	Acid Wash Transfer and Packaging System	PM/PM_{10}
26	Acid Wash Process	PM/PM_{10}
29	D-Line Coal and Pitch Preparation Area	PM/PM_{10}
31	D-Line Bakers	PM/PM_{10}, & SO2
34	D-Line Activator Furnaces	PM/PM_{10}, & SO2
35	D-Line Packaging operations	PM/PM_{10}
37	E-Line Coal & Pitch Preparation Area	PM/PM_{10}
39	E-Line Bakers	PM/PM_{10}, & SO2
42	E-Line Activator Furnaces	PM/PM_{10}, & SO2
43	E-Line Packaging Operations	PM/PM_{10}
44	D & E Bulk Loadout System	PM/PM_{10}
45	Reactivation Furnace	HF, Lead, PM/PM_{10}, SO_2, & VOC
48	Waste Disposal Silo	PM/PM_{10}
49	Soda Ash Storage Silo	PM/PM_{10}
50	Pulverizer Collection System	PM/PM_{10}
51	A, B, C & Acid Wash Fines Packaging System	PM/PM_{10}
52	Activated Carbon Fine Mesh Production	PM/PM_{10}
53	Reactivation Process for Custom Product	PM/PM_{10}

Anything unusual about the:

1. *Emission Point Numbers and Descriptions*. EP 24, "Temporary" Package Boiler. This boiler was originally permitted in V-00-015, Revision 1 as EP 64. At that time, a separate package boiler was permitted as EP 24, which included a synthetic minor limit on PM emissions. Since then, the original EP 24 package boiler has been removed from the facility.

The source requested that the "Temporary" Package Boiler be redesignated from EP 64 to 24 with the renewal permit. Although there is nothing particularly unusual about redesignating emission point numbers, it is highlighted in this case to prevent confusion with the original boiler, now removed from the site, which had a synthetic minor limit.

2. *Process Operations Regulations.* After extensive efforts by both the reviewer and the source to confirm the "commence" date as defined at 401 KAR 59:001, Section 1(24), and 401 KAR 61:001, Section 1(24), the applicable process weight rate regulation was revised for many EP's. As a result, the following EP's previously regulated by 401 KAR 61:020, *Existing Process Operations*, are now subject to 401 KAR 59:010, *New Process Operations* after application of the correct "commence" date: EP45, 48, 49, and 51. Conversely, the following EP's previously regulated by 401 KAR 59:010 are now subject to 401 KAR 61:020 after application of the correct "commence" date: EP25, 26, 39, and 42.

EMISSION AND OPERATING CAPS DESCRIPTION:

1. Synthetic Minor Limits. The following emission points that were permitted in the past are subject to federally enforceable synthetic minor limits:

Emission Point	Description	Pollutant	Synthetic Minor Limit (tpy)
09	B-Line Coal & Pitch Preparation Area	PM/PM_{10}	3.29
11	B-Line Bakers	PM/PM_{10}	21.46
		SO_2	39.00
25	Acid Wash Transfer & Packaging System	PM/PM_{10}	5.26
26	Acid Wash Process	PM/PM_{10}	7.88
27	Lime Storage Silo	PM/PM_{10}	1.86
29	D-Line Coal & Pitch Preparation Area	PM/PM_{10}	61.06
31	D-Line Bakers	SO_2	65.7
34	D-Line Activator Furnaces	PM/PM_{10}	65.7
		SO_2	65.7
37	E-Line Coal & Pitch Preparation Area	PM/PM_{10}	61.06
42	E-Line Activator Furnaces	PM/PM_{10}	60.88

Emission Point	Description	Pollutant	Synthetic Minor Limit (tpy)
43	E-Line Packaging Operations	PM/PM_{10}	49.39
45	Reactivation Furnace	HF	2.19
		NOx	117.82
		PM/PM_{10}	30.7
		SO_2	92.15
50	Pulverizer Collection System	PM/PM_{10}	35.95
52	Activated Carbon Fine Mesh Production	PM/PM_{10}	12.42
53	Reactivation Process for Custom Product	PM/PM_{10}	2.48

Each of the emission points listed above that is a source of particulate emissions is also subject to particulate matter standards under state '*process operations*' regulations (401 KAR 59:010 for sources constructed after July 2, 1975 and 61:020 for sources constructed prior to July 2, 1975). These regulations prescribe hourly particulate matter limits based on the '*process weight rate*'.

In some instances with past permits, when the emission points listed in the table above were permitted as synthetic minor sources, the annual synthetic minor PM limit was pro-rated to an hourly limit that supplanted the hourly limit prescribed by 59:010 or 61:020. In other instances, the synthetic minor limit was not pro-rated to an hourly standard.

As was done with the original Title V permit, all previous synthetic minor limits have been carried over as annual limits only (except EP 45). In those instances where the synthetic minor limit was pro-rated to an hourly standard, the synthetic minor hourly limit has been replaced with the particulate matter limit prescribed by 59:010 or 61:020. This was done to ensure consistency within the Title V permit.

2. SO2 limits taken to enforce NAAQS. As addressed during issuance of V-00-015, Revision 2, Calgon, through the use of Trinity Consultants, updated the American Meteorological Society (AMS) / U.S. EPA Regulatory Model (AERMOD) with Plume Rise Model Enhancements (PRIME) analysis in order to address proposed changes to their operations at the Big Sandy Facility in order to help demonstrate SO_2 attainment status for Boyd County. That revision incorporated the modeled parameters into the Title V permit as emission limits.

Emission Point	Description	Pollutant	Limit
12	B-Line Baker Heater	SO_2	0.0853 lb/mmBtu
14	B-Line Activator Furnace	SO_2	2.88 lb/hr & 12.6 tpy

21	C-Line Activator Furnaces	SO_2	7.72 lb/hr & 33.8 tpy
26	Acid Wash Process	SO_2	1.278 lb/hr & 5.598 tpy
32	D-Line Baker Heaters	SO_2	0.0853 lb/mmBtu
39	E-Line Bakers	SO_2	15.0 lb/hr & 65.7 tpy
40	E-Line Baker Heaters	SO_2	0.477 lb/mmBtu
42	E-Line Activator Furnaces	SO_2	15.0 lb/hr & 65.7 tpy

PERIODIC MONITORING:
For CAM, existing individual emission point and control device monitoring requirements were expanded, where required, to ensure the CAM monitoring requirements of 40 CFR 64.4(c) are met, as applicable. All CAM requirements are consolidated in the Specific Monitoring Requirements and reference other paragraphs and sections of the permit (i.e.: Recordkeeping, Reporting, and Section E – Source Control Equipment Requirements) as appropriate. For specific details, see Section B of the permit for the affected points.

OPERATIONAL FLEXIBILITY: None.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.